

**BUREAU OF HIGHWAYS
REQUEST FOR PROPOSAL
for
QUALIFICATIONS BASED SELECTION FOR PREQUALIFIED SERVICES**

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is currently prequalified for this type of work and you are interested in providing services, please indicate your interest by submitting a Proposal. The Proposal must be submitted in accordance with the latest "Vendor Selection Guidelines for Service Contracts", available on the MDOT website.

For efficiency sake, we are asking that the vendor firm provide 4 paper copies of the Proposal to the MDOT project manager named in the attached scope of services.

These copies must be received by March 4, 2005. Fax and electronic copies are not acceptable.

In addition, provide one unbound copy to:

Regular Mail:

Secretary, Operations Contract Support
Michigan Department of Transportation
P.O. Box 30050
Lansing, MI 48909

OR

Overnight Mail:

Secretary, Operations Contract Support
Michigan Department of Transportation
425 W. Ottawa
Lansing, MI 48933

This copy is to be received within three working days after the due date and time specified above. Please do not deliver in person.

Any questions relative to the scope of services must be submitted by e-mail to the MDOT project manager. Any questions must be asked at least three working days prior to the due date and time specified above. All questions and their answers will be placed on the MDOT website as soon as possible after receipt of the questions. The names of vendors submitting questions will not be disclosed.

For a cost plus fixed fee contract, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is

assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

The selection team will review the information submitted and will select the firm considered most qualified to perform the engineering services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

The maximum allowable pages for your proposal shall follow the guidelines detailed in Exhibit F of the Vendor Selection Guidelines (October 2004) for \$100,000 to \$500,000.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

The scope of services is attached to this solicitation.

I Primary Prequalification Classification:
Complex Bridge

II Secondary Prequalification Classification:
Maintaining Traffic Plans & Provisions

The anticipated start date of the service is May 2, 2005.

The anticipated completion date for the service is July 01, 2006

MDOT Project Manager: Phil Grotenhuis, P.E.

Design Support Area
Van Wagoner Building
425 W. Ottawa
P.O. Box 30050
Lansing, MI 48909
Phone: 517-335-7275
Fax: 517-335-2731
E-Mail: Grotenhuisp@michigan.gov

Qualifications:

The design firm must have experience with one or more of the following emerging technologies.

- Full depth precast deck panels
- Precast pier caps
- Precast pier columns
- Precast, prestressed superstructures

BRIDGE SCOPE OF WORK

S01-39014 JN 81325 Parkview (M Avenue) over US-131

I. Description of Work:

The work shall consist of a design for a bridge replacement and the related approach work. The Consultant shall investigate viable rapid construction technologies including full depth precast deck panels, precast substructure units (pier caps and columns but not foundations), and precast superstructure units. For a technology to be considered, it must have documented research, technical guidelines, or it must be a proven technology used by another state or agency. The consultant shall propose to the Department what rapid construction technologies are best suited for this project and indicate what benefits the technology provides. The proposed system has to be adaptable to future MDOT projects and is intended to be the step from experimental phase to developing a standard practice (for rapid construction needs).

The existing bridge is designed for HS20 loading and has 15' - 2" of underclearance. The proposed structure shall be designed for HS20 loading and 16' - 3" of underclearance. A study including a cost estimate is required to determine if any portion of the existing bridge can economically be incorporated into the proposed structure.

II. Consultant Responsibilities:

1. A complete design for the work listed above.
2. Preparation of both contract plans and bid item quantities using standard English units, as applicable. Stand-Alone Estimator's Worksheet (SAEW) shall be used to generate a bid item quantity database in both text (TXT) and comma separated value (CSV) formats.
3. Preparation of any specifications and/or special provisions required to supplement MDOT's Standard Specifications for Construction.
4. Preparation of permit requests. (MDOT will submit these).
5. Necessary contacts with concerned agencies: e.g. DEQ, municipalities, utilities, railroad, State Historic Commission. All contacts are to be documented. MDOT is to receive copies of minutes, record of conversations or memos documenting all contacts.
6. Participation in meetings and field reviews at the site.
7. Solutions to any unique problems, e.g. utility interference, staging for part width construction.
8. With concurrence from MDOT Kalamazoo TSC traffic engineer, provide traffic control to permit the work described in item 10 & 13.
9. Prepare and submit any information, calculations, or drawings required by MDOT for acquiring permits (i.e. NPDES), approvals (i.e. county drain commission) and related mitigation. MDOT will submit permit requests.
10. Any pickup survey or field measurements required to supplement the data provided by MDOT. See Attachment "A".
11. Working with Western Michigan University to select instrumentation in order to monitor the structural integrity of the structure.
12. Having a project manager who is knowledgeable with and has experience with precast deck panels and precast pier caps and columns.
13. Soil borings of sufficient depth and number and a geotechnical analysis to perform the foundation design. For scope of work statement for geotechnical services, see Appendix 5.03.03 A.1.f MDOT Bridge Design Manual.

14. With concurrence from Kalamazoo Traffic Engineer, provide plans and specifications for maintaining traffic during construction.
15. The review of shop drawings and for design assistance during the construction phase of the project however this work will be included in a future contract.
16. Prepare a construction critical path network. See attachment “C”.

The consultant shall be responsible for the following P/PMS tasks. Descriptions of the tasks can be found on the MDOT Bulletin Board System and can be found under the PPMS library.

P/PMS TASK 3340 - CONDUCT STRUCTURE SURVEY

P/PMS TASK 3360 – PREPARE BASE PLANS

P/PMS TASK 3370 - PREPARE STRUCTURE STUDY

P/PMS TASK 3390 - DEVELOP THE CONSTRUCTION ZONE TRAFFIC CONTROL CONCEPTS

P/PMS TASK 3530 – FOUNDATIONS STRUCTURE INVESTIGATION

P/PMS TASK 3540 - DEVELOP CONSTRUCTION ZONE TRAFFIC CONTROL PLAN

P/PMS TASK 3552 - DEVELOP PRELIMINARY PERMANENT PAVEMENT MARKING PLAN

P/PMS TASK 3553 – PRELIMINARY NON-FREEWAY SIGNING PLANS

P/PMS TASK 3570 - PREPARE PRELIMINARY STRUCTURE PLANS

P/PMS TASK 3580 - DEVELOP PRELIMINARY PLANS

P/PMS TASK 3822 - COMPLETE PERMANENT PAVEMENT MARKING PLAN

P/PMS TASK 3823 – COMPLETE NON-FREEWAY SIGNING PLAN

P/PMS TASK 3830 - COMPLETE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN

P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS

P/PMS TASK 3850 - DEVELOP STRUCTURE FINAL PLANS AND SPECIFICATIONS

P/PMS TASK 3870 - HOLD OMISSIONS/ERRORS CHECK (OEC) MEETING

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, etc.).

III. PROJECT SCHEDULE

The scheduled plan completion date for this project is **July 15, 2006**. The Consultant shall use the following events to prepare the proposed implementation schedule as required in the Guidelines for the Preparation of Responses on Assigned Design Services Contracts. These dates shall be used in preparing the Consultant's Monthly Progress Reports.

<u>Target Date</u>	<u>Task #</u>	<u>Description</u>
05/02/2005		Notice to Proceed (approximate date)
05/09/2005		Kickoff Meeting with Consultant Project Managers.
	3340	Conduct Structure Survey
07/01/2005	3370	Prepare Structure Study
07/15/2005		Structure Study Approval
10/01/2005	3570	Prepare Preliminary Structure Plans
10/15/2005	3590	Review Preliminary Plans (Grade Inspection - approximate date)
	3850	Develop Structure Final Plans and Specifications
06/01/2006		Submit Final Plan/Proposal Package to MDOT for final review
06/15/2006	3870	Omissions/Errors Check (OEC) Meeting (approximate date)
07/01/2006		Final Construction Plan/Proposal package with recommendations incorporated to MDOT.
07/15/2006		Final Deliverables to MDOT

IV. PAYMENT SCHEDULE

Compensation for this Scope of Design Services shall be on an actual plus fixed fee basis.

V. Project Cost

The estimated cost of construction is: \$1,982,000.

The above amount is of funding programmed for the construction of this project. If at any time the estimated cost of construction varies by more than 5% of the current programmed amount, the consultant is required to notify the project manager.

VI. Monthly Progress Report

On the first of each month, the Consultant Project Manager shall submit a monthly project progress report to the MDOT Project Manager, *Phil Grotenhuis, Road Consultant Coordinator, Michelle O'Neill and the South West Region Bridge System Manager, Zhizhen, Liu*. The monthly progress report shall follow the guidelines in Attachment "B".

VII. Format

Full size plans (cut size 24" x 36" consisting of plans sheets and profile sheets will be required.

The plans shall be submitted to MDOT as follows:

1. A study showing the conceptual design. This shall be accompanied by a rough (square foot) estimate of cost.
2. Preliminary Plans consisting of a General Plan of Site and a General Plan of Structure of the proposed work. Preliminary Plans shall be accompanied by an estimate of cost based on the quantities of major pay items shown on the plans.
3. Final plans and Contract Quantities and any special provisions or supplemental specification that may be required.

The consultant is not authorized to proceed with Preliminary Plans until he receives MDOT approval of the Study. Neither is he authorized to proceed with Final Plans until notified that the FHWA has approved Preliminary Plans.

MDOT WILL PROVIDE:

Standard detail sheets

All work shall conform to AASHTO specifications and MDOT specifications and MDOT design and detailing practices. All submittals to MDOT shall meet the attached quality assurance document. The Consultant shall maintain office records, submit monthly progress reports, and submit MDOT vouchers with their billings. The consultant is advised that MDOT considers plans **5%** complete upon approval of the study, **30%** complete when the preliminary plans are distributed, and **95%** complete when final plans are submitted for review.

The consultant is to show the location and names of all existing utilities within the limits of the proposed work. The consultant will attend any utility meetings called to insure that the concerns are addressed on the plans involving utilities.

All submittals to MDOT shall be dated and identified by structure number, control section, job number including phase, MDOT contract number, route and location.

All minutes for project related meetings shall be typewritten, recorded, and submitted within two weeks of the meeting. The MDOT Project Manager shall be the official MDOT contact person for the consultant and shall be made aware of all communications regarding this project. The consultant must either address or send a copy of all correspondence to the MDOT Project Manager. This includes all Subcontractor correspondence and verbal contact records.

The Consultant shall contact the MDOT Project Manager whenever discoveries or design alternatives have the potential to require changes in the scope, limits, quantities, costs, or right-of-way of the project.

A file containing project related correspondence, design, and any information resulting from research shall be submitted to MDOT with the final mylars.

VENDOR PAYMENT:

All invoices/bills for services must be directed to the Department and follow the 'then current' guidelines. The latest copy of the "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways" is available on MDOT's Bulletin Board System. This document contains instructions and forms that must be followed and used for invoicing/billing; payment may be delayed or decreased if the instructions are not followed.

Payment to the Vendor for Services rendered shall not exceed the "Cost Plus Fixed Fee Not to Exceed Maximum Amount" unless an increase is approved in accordance with the contract with the Vendor. All invoices/bills must be submitted within 14 calendar days of the last date of services being performed for that invoice.

Direct expenses will not be paid in excess of that allowed by the Department for its own employees. Supporting documentation must be submitted, with the invoice/bill, for all billable expenses on the Project. The only hours that will be considered allowable charges for this contract are those that are directly attributable to the CE activities of this Project. Hours spent in administrative, clerical, or accounting roles for billing and support, are not considered allowable hours; there will be no reimbursement for these hours.

Reimbursement for overtime hours will be limited to time spent on this project in excess of forty hours per week. Any variations to this rule should be included in the price proposal

ATTACHMENT A

SURVEY SCOPE OF WORK

Survey Limits: As needed for Design, Right of Way, and Construction.

Previous Survey and Mapping: The Consultant will be supplied with aerial mapping of the project area. The mapping was done in MicroStation format by the MDOT Photogrammetry Unit in 1998, photo scale 1:5000. The project was originally mapped in meters, planimetric and terrain, as a part of US-131 mapping in NAD 83 State Plane Coordinates. The mapping files have been converted to feet. The Consultant will also be supplied with survey ground control in the original metric units.

NOTES: The Consultant shall discuss the scope of this survey with an MDOT Region Surveyor or Lansing Design Support Area Surveyor before submitting a proposal.

The Consultant surveyor must contact the Region or TSC Traffic and Safety Engineer for work restrictions in the project area prior to submitting a proposal.

A **detailed Survey Work Plan** with a **spreadsheet estimate** of hours by specific survey task such as traversing, leveling, mapping, etc., **must** be included in the project proposal.

It is the responsibility of the Professional Surveyor to safeguard all corners of the United States Public Land Survey System, published Geodetic Control and any other Property Controlling corners that may be in danger of being destroyed by the proposed construction project.

GENERAL REQUIREMENTS:

1. Surveys must comply with **all Michigan law** relative to land surveying.
2. Surveys must be done under the **direct supervision** of a Professional Surveyor licensed to practice in the State of Michigan.
3. Work in any of the following categories of survey: Road Design, Bridge, Hydraulic, Right-of-Way, and/or Ground Control (Photogrammetric) must be completed by a survey firm which is pre-qualified by MDOT.
4. Surveys must meet all requirements of the Michigan Department of Transportation (MDOT) Design Surveys *Standards of Practice* dated April 1, 1998. Please contact the Design Survey office to clarify any specific questions regarding these standards.
5. Consultants must obtain all necessary permits required to perform this survey on any public and/or private property, including an up-to-date permit from the MDOT Utilities Coordination and Permits Section.
1. The Consultant must contact any and all Railroads prior to commencing field survey on railroad property. The cost for any permit, flaggers and/or training that is required by the Railroad will be considered as a direct cost, but only if included in the Consultant's proposal.
7. The Consultant must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job.

8. Consultants are responsible for a comprehensive and conscientious research of all records, including MDOT records, essential for the completion of this project.
9. Measurements, stationing, recorded data, and computations must be in international feet, unless specified otherwise by the Project Manager.
10. Coordinate values shall be based upon the Michigan State Plane coordinate system **NAD83, South Zone**. All elevations must be based upon the North American Vertical Datum of 1988 (**NAVD88**). **Other datums must be approved by the MDOT Design Division, Supervising Land Surveyor or the MDOT Project Manager.** A preliminary submittal of the adjusted Horizontal and Vertical control for the project may be submitted to the MDOT Survey Consultant Coordinator or Region Surveyor for review and acceptance as soon as it is available.
11. The survey notes must be submitted to the Design Survey Unit in 10" by 12" divided portfolios with flap covers. As many portfolios should be used as are needed to contain all of the required documents and Compact Discs (CD's). **Duplicate CD's must be included in the portfolio, with one set labeled "Region Surveyor".**
12. Each portfolio must be labeled on the outside as in the following example:

Survey Notes for:

Route, Location and Project Limits [US-131 under Parkview Street]

Control Section [S01 of 39041] Job Number [xxxxxD] Date [*of submittal*]

By [*Name of Firm*]

Michigan
Professional
Surveyor[
]
License # [
]

13. Each submittal is to be divided into five sections. These sections are to be labeled as follows:
Administrative, Alignment, Control, Property, Mapping, and Miscellaneous.
 - a. The Administrative section will include the following items: a completed copy of the MDOT Form 222(3/99) entitled "SURVEY NOTES: RECEIPT AND TRANSMITTAL"; the limits of the survey and original survey scope as determined by the consultant Surveyor and Design Engineer; a complete synopsis of the survey **that shall include, but not be limited to** horizontal and vertical control datums used; methodology; a complete discussion of government corners recovered, perpetuated or otherwise used as part of the survey; problems encountered; and a statement from the Consultant surveyor supervising the project certifying compliance with Michigan Department of Transportation (MDOT) Design Surveys *Standards of Practice* dated April 1, 1998; as well as documentation of all project specific meetings and /or conversations with MDOT Survey personnel.
 - b. The Alignment section will contain a sketch and/or drawing of the alignment, witnesses and stationing of alignment points set or found; an explanation of how the alignment was determined, whether best fit or legal; and all supporting documentation. The alignment data must be submitted both hardcopy and electronically.
 - c. The Control section must contain the data collected and copies of all research documents used to establish the **horizontal and vertical** reference systems for the project, and must include a thorough written explanation describing how the systems were established. This section should also contain a complete list of control coordinates, control traverse raw data, least squares analysis for both traverse and benchmarks, a separate listing of control point coordinates and witnesses for mapping and construction staking of the project. A complete Benchmark list with datum, station

and offset, elevation, and description of each benchmark shall also be included. This information must be submitted in hardcopy and ASCII electronic file format on Compact Discs (CD's). Also, a sketch of the control traverse, showing any ties (government corners, property, alignment, etc.) shall be included in this section.

d. The Property section contains all information that is utilized regarding the real property affected by the project. It also includes any and all property ties necessary to establish the Right of Way and/or acquire property if required by the project. This may include copies of all **recorded** Land Corner Recordation Certificates for the government corners used or reestablished, recorded plats, recorded certified surveys, tax maps, tax descriptions, and adjacent/riparian owners, as well as surveyed coordinates.

e. The Mapping section must consist of electronic data only. The final planimetric mapping file must be submitted in .PDF format. Raw survey data is not required.

f. The Miscellaneous section contains any information not included in the previous sections. The project surveyor's report should specify any items included in this section.

14. Each category of survey must be packaged separately (i.e., Bridge surveys separate from Road surveys and Hydraulic surveys). All sheets in a portfolio must be marked with the control section and job number. CD's must be labeled with the control section, job number, data type and file names.
15. The Consultant representative shall record and submit typewritten minutes for all project related meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees.
16. The MDOT Project Manager is the official contact for the Consultant. The Consultant must send a copy of all project correspondence to the MDOT Project Manager. The MDOT Project Manager shall be made aware of all communications regarding this project. Any survey related questions should be directed to Survey Consultant Coordinator Thomas Bogren at 517-335-1914 or e-mail bogrent@michigan.gov.

At the completion of this survey for this project, all field survey notes, all electronic data, and all research records obtained for this project will be considered the property of MDOT and **must be sent to** the MDOT, Design Division, Supervising Land Surveyor, P.O. Box 30050, Lansing, MI 48909. Please use MDOT's Form 222(3/99) entitled "SURVEY NOTES: RECEIPT AND TRANSMITTAL" for all transmittals. A copy of this transmittal form must also be sent to the MDOT Project Manager for Design.

WORK RESTRICTIONS

The Consultant must call the MDOT Region or TSC Traffic and Safety Engineer before beginning work to inform him of surveying activity in the area. The Consultant is advised to discuss Traffic Control scenarios with the Traffic and Safety Engineer prior to submitting a proposal.

Traffic shall be maintained by the Consultant throughout the project in accordance with Sections 812 and 922 of the Standard Specifications for Construction, 2003 edition, and any supplemental specifications. All traffic control devices shall conform to the current edition, as revised, of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

The Consultant must use MDOT standard lane closure "maintaining traffic" typicals for any and all lane closures and shoulder closures. Typical MDOT traffic control diagrams are available on line at <http://www.mdot.state.mi.us/tands/plans.cfm>

FIELD SURVEY

The purpose of the field survey is to obtain all information and data required by the project design engineer, to leave control in the field for future construction staking, and to provide a sufficient history of the area to enable the

MDOT Design Survey Unit to perform dependable surveys in the future. The Consultant surveyor must discuss the scope of this survey with the project design engineer before initiating any work on this project. Notes of this meeting and a detailed Survey Work Plan with an estimate of hours broken down by specific survey task must be submitted to the MDOT Project Manager and Survey Consultant Coordinator within two weeks of this meeting.

GOVERNMENT CORNERS

Any PLSS corners within the project limits must be recovered or established and tied to the project coordinate system.

All PLSS corners must be recorded in accordance with PA 74 of 1970, as amended, and all applicable administrative rules. A copy of each recorded Land Corner Recordation Certificate must be submitted to the MDOT Design Survey Office as part of the final report. All PLSS corners located in hard surface roads must be protected by a monument box, regardless of impending construction. The consultant shall provide to the Survey Project Manager a list of any affected Government or Property Controlling Corners in the detailed work plan for discussion or approval.

The Consultant surveyor must contact the County Remonumentation Representative prior to beginning work on the project to inform him of proposed corner perpetuation activities, and to obtain information pertinent to PLSS corners and/or property controlling corners affected by project construction.

FINAL REPORT: DELIVERABLES One portfolio, two sets of data CD's

The final report for this project shall include the following:

1. In the first pocket of the first portfolio, MDOT's Form 222(3/99) entitled "SURVEY NOTES: RECEIPT AND TRANSMITTAL."
2. The project's Professional Surveyor's Report on company letterhead consisting of the following:
 - a. A comprehensive report, written and signed by the project's Professional Surveyor, of the work performed on this project.
 - b. The source and the methods used to establish the project horizontal coordinates, elevations, and the alignment(s) for this project.
 - c. A detailed explanation of anything discovered during the survey of this project that may create a problem for the designer or another surveyor.
3. Documentation of horizontal and vertical datum sources.
4. Least squares analysis for horizontal and vertical control.
5. Coordinate and witness lists for the horizontal alignment ties, government corners, traverse control points, and bench marks.
6. A sketch of the alignment(s) with reference points and angle of crossing (if appropriate), stationing, horizontal coordinates, curve data, and a station equation to existing stationing if different. **The alignment must be clearly noted as legal or best-fit.**
7. Control sketch with control points, government corners and alignment plotted.
8. All field survey notes, all electronic survey data files, all calculation sketches, and all research records obtained for this project. All electronic survey data files shall be submitted on Compact Discs only, specifically labeled. No paper copy of raw survey data is required.

9. Legible copies of all **recorded** Land Corner Recordation Certificates (with Liber and Page number) filed or used for the performance of this survey, and for any PLSS corners, including Property Controlling Corners, which may be disturbed by construction.
10. It is the responsibility of the consultant to insure that all electronic files submitted to MDOT conform to the required format and all documents are legible.
11. The consultant must organize and label the various sections of the portfolios as required by the MDOT Design Surveys *Standards of Practice* dated April 1, 1998.
12. It is not necessary to submit hardcopy mapping data in the survey portfolio for a consultant survey/consultant design in the same authorization. Final planimetric map must be submitted in .PDF format.
13. It is desirable to limit paper and to include as much electronic data as possible on Compact Disc, including scanned items, to facilitate future electronic storage and transmission of survey data. **Duplicate CD's must be included in the portfolio, with one set labeled "Region Surveyor".**

ATTACHMENT "B"

MONTHLY PROGRESS REPORTS

This attachment shows the necessary layout of the Monthly Progress Reports.

Control Section 00000
Job Number 00000C
Structure Number S00
Date 00/00/00

MONTHLY PROGRESS REPORT

- A. Work accomplished during the previous month.
- B. Anticipated work items for the upcoming month.
- C. Real or anticipated problems on the project.
- D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.
- E. Items needed from MDOT.

F. Copy of Verbal Contact Records for the period (attached).

Structure Number - Control Section - Job Number
Route, Location Description
Design Schedule as of 00/00/95

Original (Anticipated)

Authorized or **Actual**
Date Dates

00/00/00	00/00/00 Initial project meeting.
00/00/00	00/00/00 Completion of Pre-Grade Inspection.
00/00/00	00/00/00 First maintaining traffic coordination meeting.
00/00/00	00/00/00 Completion of design survey.
00/00/00	00/00/00 Submittal of preliminary plans for geometric review.
00/00/00	(00/00/00) Submit request for soil borings and soils recommendations.
00/00/00	(00/00/00) Submittal of Preliminary Right-Of-Way Plans.
00/00/00	(00/00/00) Submittal of Grade Inspection materials.

VERBAL CONTACT RECORD

Control Section 12345

Job Number 11111C

Structure Number S02

Date 07/31/95

Joe Engineer talked to Tom Myers and decided to use a 0.05'/ft super on ramp A leading into the bridge.

ATTACHMENT "C"

CONSTRUCTION CRITICAL PATH NETWORKS

I. INTRODUCTION

The Consultant is required to submit a Construction Critical Path Network at various points in the design process. Refer to the following:

P/PMS TASK 3580 - DEVELOP PRELIMINARY PLANS

P/PMS TASK 3830 - COMPLETE THE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN

P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS

Construction Critical Path Networks are often needed to develop the progress schedule for a project. They are required on any project designated to include an Incentive/Disincentive or Special Liquidated Damages clause. Construction Critical Path Networks are also recommended for projects with the following characteristics:

1. New construction.
2. Major reconstruction or rehabilitation on an existing roadway that will severely disrupt traffic.
3. Unique or experimental work.
4. More than one construction season.
5. Complex staging(multiple stages with traffic shifts).

As noted in MDOT's Construction and Technology Instructional Memorandum 1997-7, Progress Schedule Determinations/Critical Path Rates,

A preparation of a Critical Path is a requirement on all consultant-designed projects, regardless of the project type or complexity.

The MDOT Resident Engineer assigned to the project should be consulted when developing Construction Critical Path Networks.

MDOT requires the precedence diagramming method. The Consultant will submit this network in MPX version 4.0.

II. NETWORK DEVELOPMENT

The network will be defined using the following steps.

1. Activity definition.
2. Activity sequencing.
3. Duration estimation.
4. Schedule development.

1. ACTIVITY DEFINITION

The Consultant will define the specific activities in enough detail so that the proper objectives will be met. The Consultant must identify assumptions (those factors considered true, real or certain). Supporting detail for the

activities should be documented and organized as needed to simplify the review of the activities by MDOT personnel.

The Construction Critical Path Network must start with the ALetting Date@ as the first activity and terminate with the AEnd of Project@ as the finish activity.

A sufficient number of activities will be required with sufficient detail so that the controlling construction operation(s) may be identified. Notation on each activity shall include a brief work description and activity time duration.

2. ACTIVITY SEQUENCING

Activity sequencing involves identifying and documenting interactivity dependencies. The Consultant must sequence activities accurately to support later development of a realistic and achievable construction schedule. Two types of dependencies should be considered. Mandatory dependencies are inherent in the nature of the work being done, such as construction sequencing. Discretionary dependencies are based on a knowledge of the work to be done. Constraints are used to show how the activities relate to each. The Consultant must include documentation supporting all discretionary dependencies used in the project. All activities must lead to another activity.

3. DURATION ESTIMATION

After the Consultant has sequenced the activities, the Consultant should determine the activity duration. Activity duration estimating involves assessing the number of work periods likely to be needed to accomplish each activity. The approved MDOT production rates will be used in estimating activity duration. These are available in the Supplemental Information section of this appendix. The Consultant must document and submit all assumptions made during the duration estimation to MDOT.

4. SCHEDULE DEVELOPMENT

The activity sequencing, duration estimations and the calendars are combined to create the construction schedule. During the development of the schedule the Consultant will verify:

1. The required schedule to build the project.
2. The constructability of the project.
3. If the maintaining traffic scheme will work.
4. If seasonal limitations will affect the construction.
5. Any other project specific considerations.

The MDOT Calendars will be used by the Consultant in developing the network. The calendars are based on a 4, 5 or 6 day work week. The MDOT Calendars are included in the Supplemental Information section of this appendix.

At this point there should be no negative float in the network. If there is, there is an error in the network and the error must be corrected before network submittal.

III. DELIVERABLES

After this final step the design consultant will submit the finished CPM schedule to MDOT

1. Documents

- A. 11" x 17" plot of the network. The critical path shall be clearly identified on the plot. A larger plot may be required for complex networks.
- B. Work Day / Completion Date Determination Worksheet.
- C. List of any other assumptions or controlling factors used in creating the network. For example, permit or maintaining traffic restrictions.

2. Electronic Format

This section sets the requirements for the electronic submittal of the Consultant=s Construction Network. All networks shall be submitted on a 3.5 inch floppy disk (or via E-mail) using one of the following formats:

- A. **Standard Electronic Media Format:** This is a standard ASCII text file containing the data elements below, in the order specified. This file can be created using any text editor or word processing application (i.e., MS-Word, WordPerfect, Notepad, Write) but must be saved as an ASCII file.

The **first line** will provide a descriptive header describing the submittal and containing:

Control Section
Job Number
Route
Consultant name
Date of Submittal

The next line will be **blank**, followed by multiple data lines.

Each **data line** will contain one record pertaining to one task of the job. Separate data fields by a comma. Fields within each task line are as follows:

(Note that the term "task" is synonymous with "activity." Leave fields that are not required blank)

- (1) Task # (Job # followed by a hyphen followed by this task's unique 4 digit task number. This is the Preceding Event Activity Code)
- (2) Description of Task, Milestone or Hammock, blank if this record is a constraint
- (3) Calendar (see attached list)
- (4) Duration of task, blank for constraints
- (5) Task # of the next task (Succeeding Event) - leave blank if this record is not a constraint or hammock
- (6) Type of constraint (FS, SS, SF, HAM) - leave blank if this record is not a constraint or hammock. A hammock is a special type of constraint that groups several tasks together. The hammock starts with the start of the first task in the group and finishes with the finish of the last task.
- (7) Delay, if required
- (8) Original "Baseline" Start Date
- (9) Original "Baseline" Finish Date
- (10) Current (forecast) Start Date (early start)
- (11) Current (forecast) Finish Date (early finish)
- (12) Estimated completion date (if different from early start + current duration)
- (13) Late Start Date
- (14) Late Finish Date
- (15) Actual Start Date
- (16) Actual Finish Date

Example - each line contains the following:

Task # (preceding event), Description, Calendar, Duration, Next Task # (succeeding event), Constraint Type, Delay, Baseline Start, Baseline Finish, Early Start, Early Finish, Estimated Completion Date, Late Start, Late Finish, Actual Start, Actual Finish, Total Float.

- B. **Primavera Project Planner(P3) 2.0 Export Procedure:** Users who have Primavera Project Planner(P3) version 2.0 can automatically create a export file by following the below export procedure below. **Users having an older version of Primavera may use the applications export feature only if they are able to include all the data elements listed in the version 2.0 format.**

1. Choose Tools, Project Utilities, **EXPORT**
2. Click **ADD**, then click **OK** to accept the next sequential ID number, or type a unique number to identify the specifications and click **OK**
3. Enter a description for the specification in the Title field
4. **Specify data items to export**

Activities

- Select **Contents of List**
- Use the Description column to specify which data items to export
- To add items, click the right mouse button in the Description column and choose from the list. Suggested Items include: **Activity ID, Activity Description, Actual Start, Actual Finish, Calendar ID, Early Start, Early Finish, Late Start, Late Finish, Original Duration.**
- Select **All Current, All Target, or All Target2**
- Set Description Length to 48

OR

Constraints

- Select **Successor relationships** - Choose this option to export Activity IDs and their corresponding successors only. Lags and relationship types will also be displayed in this output file.

5. Click **FORMAT** in Export Dialog Box
6. In the Output file section, enter a new name and path (ex. A:\actexp or A:\conexp). Do not include a file extension.
7. In the type field, click the minimize button and choose the **[.PRN] - ASCII** file format for the output file.
8. Select **CALENDAR** for Date Format
9. Set ASCII Output Field Separation to **1** and Blank column width to **0**
10. Click **RUN**
11. In the Output Options dialog box, click on **OK**

NOTE: A COMPLETED FILE EXPORT WILL CONSIST OF 2 EXPORT FILES (ACTIVITIES & CONSTRAINTS)

- C. **Microsoft Project Export Procedure:** Users of Microsoft Project Version 4.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the Save File as Type box Select **MPX 4.0**
3. On the drive box select a: or whichever drive is the 3.5" Floppy drive

4. Click on **OK**

This saves the file in MPX format.

- D. **Primavera Sure Track:** Users of Sure Track Version 2.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the filename box input a filename
3. In the Save File as Type box Select **MPX**
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive
5. Click on **OK**

This saves the file in MPX format

- E. **Scitor Project Scheduler 7 Export Procedure:** Users of Scitor Project Scheduler Version 7 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In filename box select a filename
3. In the Save File as Type box Select MPX
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive
5. Click on **OK**

This saves the file in MPX format

- F. **Export Files with Other Scheduling Applications:** Most scheduling packages have export functions similar to those described above. If the Consultant chooses to use packages with export capabilities, they shall include all items listed in the Standard Media Format in a text or ASCII type file.

IV. SUPPLEMENTAL INFORMATION

A. MDOT CRITICAL PATH-CONSTRUCTION TIME ESTIMATES

Drainage

Cross Culverts

Rural Highways	40 m/day
Expressways	50 m/day
Large Headwalls	5 days/unit
Slab or Box Culverts	5 days/pour
Plowed in Edge Drain(production type project)	4500 m/day
Open Graded Underdrain(production type project)	1200 m/day

Sewers

0m-5m(up to 1500mm)	40 m/day
0m-5m(over 1500mm)	25 m/day
5m-over(up to 1500mm)	25 m/day
5m-over(over 1500mm)	20 m/day
Jacked-in-place	13 m/day
including excavation pit & set up	min. 5 days

Tunnels

hand mining	8 m/day
machine mining	20 m/day
including excavation pit & set up	min. 5 days

Manholes

3 units/day

Catch Basin

4 units/day

Utilities

Water Main(up to 400mm)	100 m/day
Flushing, Testing & Chlorination	4 days
Water Main(500mm-1050mm)	25 m/day
Flushing, Testing & Chlorination	5 days
Order & Deliver 600 mm HP Water Main	50 days/order
Gas Lines	100 m/day

Earthwork and Grading

	Metro Exp	Rural
Embankment(CIP)	1500 m3/day	5300 m3/day
Excavation and/or Embankment(Freeway)	1500 m3/day	9200 m3/day
Excavation and/or Embankment(Reconstruction)	750 m3/day	3800 m3/day
Embankment(Lightweight Fill)	300 m3/day	600 m3/day
Muck(Excavated Waste & Backfill)		1500 m3/day
Excavation(Widening)	600 m/day	
Grading(G & DS)		750m/day
Subbase and Selected Subbase(up to 7.4m)	600 m/day	
Subbase and Selected Subbase(7.4 m & over)	450 m/day	
Subgrade Undercut & Backfill	1500 m3/day	
Subbase & Open-Graded Drainage Course	450 m/day	

Surfacing

Concrete Pavement(7.3m)	450 m/day
Including Forming & Curing	min. 7 days
Bituminous Pavement(7.3m)	1200 m/day/course

Concrete Ramps(4.9m)	300 m/day
Including Forming & Curing	min. 7 days
Curb(1 side)	750 m/day
Concrete Shoulder-Median	1200 m ² /day
Bituminous Shoulders(1 side per course)	750 m/day
Sidewalk	180 m ² /day
Sidewalk(Patching)	65 m ² /day

Structures

Sheeting(Shallow)	30 m/day
General Excavation at Bridge Site	750 m ³ /day
Excavation for Substructure(Footings)	1 unit/day
Piles(12m)	15 piles/day
Substructure(Piers & Abutments)	5 days/unit
Order and Delivery of Beams	
Plate Girders	100-120 days/order
Rolled Beams	90-120 days/order
Concrete Beams	50 days/order
Erection of Structural Steel	3 days/span

Bridge Decks

Form & Place Reinforcement(60m Structure)	15 days
Pour Deck Slab(1 1/5 days/pour)	2 days/span
Cure	14 days

2 Course Bridge Decks

- Add 9 days for Second Course Latex
- Add 12 days for Second Course Low Slump

Sidewalks and Railings

Sidewalks and Parapets	5 days/span
Slip Formed Barriers	2 days/span
Clean Up	10 days

Pedestrian Fencing

Shop Plan Approval & Fabrication	1-2 months
Erection	1 week/bridge

Rip Rap Placement

Bucket Dumped	385 m ³ /day
Bucket Dumped and Hand Finished	131-523 m ³ /day

Retaining Walls

1 Panel/day
min. 10 days

Railroad Structures

Grade Temporary Runaround	750 m ³ /day
Ballast, Ties & Track	50 m/day
Place Deck Plates	5 days/span
Waterproof, Shotcrete & Mastic	5 days/span

Railroad Crossing Reconstruction

10-15 work days
(depends on if concrete base is involved)

Temporary Railroad Structures

Order & Deliver Steel	55 days/order
Erect Steel	1 day/span
Ties and Track	3 days/span

Pumphouse

Structure	30 days/m
Order & Deliver Electrical & Mechanical Equipment	90 days
Install Electrical & Mechanical Equipment	30 days

Miscellaneous

Removing Old Pavement	60 m/day
Removing Old Pavement for Recycling(7.3m)	450 m/day
Crushing Old Concrete for 6A or OGDC	1350 mtons/day
Removing Trees(Urban)	15 units/day
Removing Trees(Rural)	30 units/day
Removing Concrete Pavement	450 m2/day
Removing Sidewalk	250 m2/day
Removing Curb & Gutter	450 m/day
Removing Bituminous Surface	1600 m2/day
Conditioning Aggregate	900 m/day
Bituminous Base Stabilizing	2500 m2/day
Ditching	600 m/day
Trenching for Shoulders	750 m/day
Station Grading	610 m/day
Clearing	8000 m2/day
Restoration(Topsoil, Seeding, Fertilizer & Mulch)	1650 m2/day
Sodding	2100 m2/day
Seeding	40000 m2/day
Guard Rail	230 m/day
Fence(Woven Wire)	360 m/day
Fence(Chain Link)	150 m/day
Clean Up	600 m/day
Concrete Median Barrier	300 m/day
Cure	min. 7 days
Reroute Traffic(Add 4 days if 1st item)	1 day/move
Concrete Glare Screen	450 m/day
Light Foundations	6 units/day
Order & Delivery	6-8 week/order
Remove Railing & Replace with Barrier(1 or 2 decks at a time)	4 days/side
Longitudinal Joint Repair	1600 m/day
Crack Sealing	4800 m/day
Joint and Crack Sealing	500 m/day
Repairing Pavement Joints - Detail 7 or 8	200 m/day
Seal Coat	6400 lane m/day
Diamond Grinding/Profile Texturing Concrete	3300 m2/day
Rest Area Building	
Order Material	3 months
Construct Building	9 months
Tower Lights	
Order and Deliver Towers	100 days

Weigh-In-Motion	
Order and Deliver Materials	1 month-6weeks
O & D with Installation	3 months
Raised Pavement Markers	300 each/day
Attenuators	2 each/day
Shoulder Corrugations, Ground or Cut	8 km-9.7 km/side/day
Aggregate Base	2900 m ² /day
Aggregate Shoulders	350 m ³ /day
Freeway Signing - 3# Post Type	50 signs/day

Concrete Joint Repair(High Production-Projects with > 1000 patches)

Average(1.8m)	50 patches/day
Large(>1.8m)	500 m2/day

Bridge Painting	90 m2/day
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Pin and Hanger Replacement

Order Pin & Hanger	3 beams/day
	60 days

Bridge Repair

Scarifying(Including Clean up)	10000 m2/day
Joint Removal(Including Clean up)	4 m/day
Forming & Placement	3.5 m/day
Hydro-Demolishing	300 m/day
Barrier Removal	15 m/day
Placement	45 m/day
Hand Chipping (Other than Deck)	.24 m ³ /person/day
Shoulder Corrugations, Ground or Cut	8 km-9.7 km/side/day
Casting Latex Overlay	250 m/day
Curing Overlay	
Regular	4 days
High Early	1 day
Thrie Beam Retrofit	30 m/day
Beam End Repairs	
Welded Repairs	.75 days/repair
Bolted Repairs	.50 days/repair
Bolted Stiffeners (Pair)	.25 days/repair
Grind Beam Ends	.25 days/repair
Welded Stiffeners (Pair)	.25 days/repair
Welded Repair	.50 days/each
Replacement	1 day/each
Deck Removal	235 m ² /day

H-Pedestal Repairs:

Surfacing-Bituminous

Metro-Primary(<18000mtons)	
Paving	540 mtons/day
Joints	150 m/day
Cold Milling	3400 m2/day
Aggregate Shoulders	900 mtons/day
Metro Primary(>18000mtons)	
Paving	540 mtons/day

Joints	200 m/day
Cold Milling	7500 m2/day
Metro Interstate(>18000mtons)	
Paving	1100 mtons/day
Joints	360 m/day
Aggregate Shoulders	900 mtons/day
Urban Primary(<18000mtons)	
Paving	640 mtons/day
Joints	100 m/day
Cold Milling	1700 m2/day
Rubblizing	1700 m2/day
Aggregate Shoulders	450 mtons/day
Urban Primary(>18000mtons)	
Paving	1000 mtons/day
Joints	120 m/day
Cold Milling	1700 m2/day
Aggregate Shoulders	500 mtons/day
Urban Interstate(>18000mtons)	
Paving	1200 mtons/day
Joints	220 m/day
Cold Milling	1700 m2/day
Rubblizing	5800 m2/day
Aggregate Shoulders	640 mtons/day
Rural Primary(<18000mtons)	
Paving	640 mtons/day
Joints	120 m/day
Cold Milling	590 mtons/day
Crush & Shape	10000 m2/day
Aggregate Shoulders	640 mtons/day
Rural Primary(>18000mtons)	
Paving	1100 mtons/day
Joints	150 m/day
Cold Milling	800 mtons/day
Crush & Shape	10000 m2/day
Rural Interstate(>18000mtons)	
Paving	1280 mtons/day
Joints	220 m/day

B. WORKSHEET

WORK DAY/COMPLETION DATE DETERMINATION

CS: _____ JN: _____

DESCRIPTION OF WORK: _____

MAJOR WORK ITEM	PRODUCTION QUANTITY	RATE	ESTIMATED TIME
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TOTAL ESTIMATED TIME:

COMPLETION DATE: _____ (Calendar Days or Work Days)

COMMENTS:

C. MDOT CALENDARS

The following are the MDOT 4, 5 and 6 day calendars:

CALENDAR	DESCRIPTION	START	FINISH
1	Std - Apr 16 - Nov 15 - 4 day	APR 16	NOV 15
2	LP - Bit Stab - 4 day	MAY 15	OCT 15
3	UP - Bit Stab - 4 day	JUN 01	OCT 01
4	LP S of M-46 - Bit Pave - 4 day	MAY 05	NOV 15
5	LP N of M-46 - Bit Pave - 4 day	MAY 15	NOV 01
6	UP - Bit Pave - 4 day	JUN 01	OCT 15
7	LP - Bit Seal Coat - 4 day	JUN 01	SEP 15
8	UP - Bit Seal Coat - 4 day	JUN 15	SEP 01
9	Tree Planting - Deciduous - 4 day	MAR 01 OCT 01	MAY 15 NOV 15
10	Tree Planting - Evergreen - 4 day	MAR 01	JUN 01
11	South LP - Restoration - 4 day	MAY 01	OCT 10
12	North LP - Restoration - 4 day	MAY 01	OCT 01
13	UP - Restoration - 4 day	MAY 01	SEP 20
14	Full Year - Winter Work - 4 day	JAN 01	DEC 31
21	Std - Apr 16 - Nov 15 - 5 day	APR 16	NOV 15
22	LP - Bit Stab - 5 day	MAY 15	OCT 15
23	UP - Bit Stab - 5 day	JUN 01	OCT 01
24	LP S of M-46 - Bit Pave - 5 day	MAY 05	NOV 15
25	LP N of M-46 - Bit Pave - 5 day	MAY 15	NOV 01
26	UP - Bit Pave - 5 day	JUN 01	OCT 15
27	LP - Bit Seal Coat - 5 day	JUN 01	SEP 15
28	UP - Bit Seal Coat - 5 day	JUN 15	SEP 01
29	Tree Planting - Deciduous - 5 day	MAR 01 OCT 01	MAY 01 NOV 15
30	Tree Planting - Evergreen - 5 day	MAR 01	JUN 01
31	South LP - Restoration - 5 day	MAY 01	OCT 10
32	North LP - Restoration - 5 day	MAY 01	OCT 01
33	UP - Restoration - 5 day	MAY 01	SEP 20
34	Full Year - Winter Work - 5 day	JAN 01	DEC 31

35	Full Year - Expedited - 6 day	JAN 01	DEC 31
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